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## (54) Hairbrush

(57) In a hairbrush having a base portion 1 for implantation of bristles and a grip portion, 3, bristles are implanted dispersed from the center axis in the radial direction on a cross-sectional plane of said implantation portion in such a fashion that the plane defined by the tips of said bristles describes an arcuate shape Fig 2, the plane defined by the tips of said bristles is outwardly concave in the longitudinal section, and the axis of rotation B of said grip portion in the longitudinal direction is parallel with the center axis A of said bristles and is spaced apart therefrom by 5 to 15 mm on the side of said bristles.

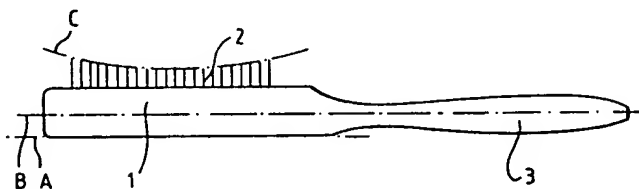


Fig.1.

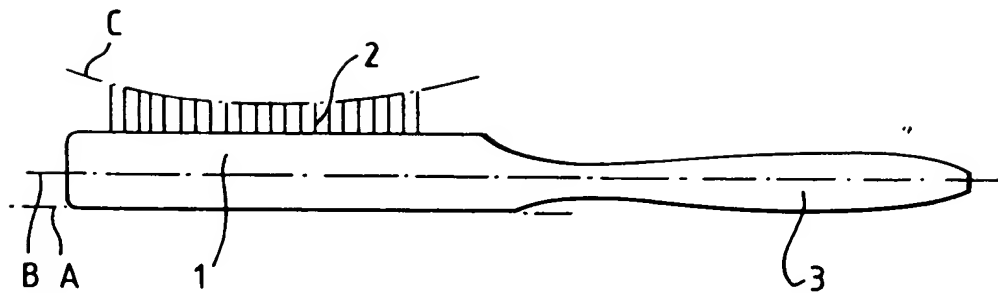


Fig. 1.

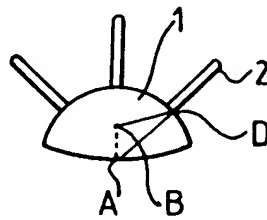


Fig. 2.

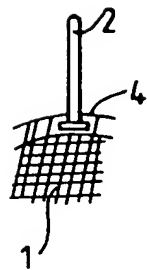


Fig. 3.

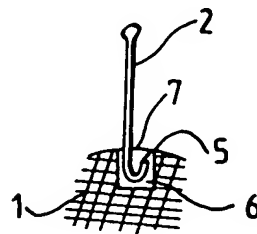


Fig. 4.

## SPECIFICATION

## Hairbrush

5 This device relates to a hairbrush, and more particularly to an improvement in or relating to a hairbrush of a type in which bristles are implanted in a radially dispersed arrangement in an implantation portion of a base. The present device is directed to  
10 provide a hairbrush which has excellent hair-holding properties when used for a permanent wave or straight hair and moreover has extremely good ability to separate the hairs in drying.

A conventional hairbrush has a construction in  
15 which bristles are implanted in zigzag fashion in a bristle implantation portion of a base, which is generally referred to as a "handle", around its entire periphery or a part of the periphery.

However, a roll brush (a hairbrush of a type in  
20 which bristles are implanted around its entire periphery) using animal hairs as the bristles has a large number of bristles per implantation hole. For this reason, the hair is difficult to comb when forming a desired hair style during blow drying,  
25 the bristles have a low hair-holding property and curls cannot be formed sufficiently. Furthermore, since excess hair is easily entangled, it tends to be pulled so that discomfort is caused, and so the feel of the hairbrush during use is not good.

30 On the other hand, a roll brush of a type in which one moulded bristle is implanted in each hole and a roll brush of a type in which two or four filamentary plastic bristles are implanted in each hole have been proposed in place of roll brushes  
35 using animal hair. However, they are not free from the problems of the entanglement of excess hair and discomfort during use, and cannot essentially solve the problems of the roll brush using animal hairs. A so-called "half-round brush", in which the  
40 bristles are implanted around about a quarter of the periphery, is easy to use and brings about less entanglement of the hairs, but involves the problems that the hair-holding property of the bristles is low and the ability to form curls as well as the  
45 capacity of extending the curls of permanently-waved hair is low.

As described above, hairbrushes, particularly those hairbrushes which are used during blow drying for finishing a desired hair style while  
50 drying the hair with a dryer, have not yet been fully satisfactory, and demands for improved hairbrushes have been strong.

The inventors of the present device have made intensive studies in search of hairbrushes which  
55 satisfy all the requirements for curl formation capacity, curl extending capacity for permanently waved hair, and have found that a hairbrush of a type in which the tips of the bristles, implanted in a radially dispersed arrangement in an implantation  
60 portion of a base, describe a specific curvature, has an excellent hair-holding property when used for permanently-waved or straight hair, and exhibits good ability to separate the hair during blow drying.

65 In a hairbrush according to the invention, having

a base comprising an implantation portion from which bristles project and a grip portion formed as a continuation of the implantation portion, the bristles converge radially on a longitudinal bristle axis  
70 in such a fashion that the surface defined by the tips of said bristles is arcuate in cross-section and concave in longitudinal section, and the axis of rotation of said grip portion in the longitudinal direction is parallel with the bristle axis and spaced  
75 therefrom by from 5 to 15 mm on the side of the exposed portions of said bristles.

In a preferred embodiment of the hairbrush of the invention, the cross-section of the implantation portion is constant. It is also preferred that the surface of the implantation is arcuate with a radius of curvature of 10 to 30 mm on the cross-sectional plane of the implantation portion.

In the hairbrush of the present invention, the surface defined by the tips of the bristles describes an arc in section in the longitudinal direction, and the radius of this is preferably from about 300 to about 500 mm. To accomplish the objects described above, it is preferred also that in the hairbrush of the present device, the longitudinal axis  
85 of rotation of the grip portion is parallel with the bristle axis and is spaced from the latter on the side of the bristles. Also, it is preferred that the bristles meet the implantation portion at points such that the distance between said points for the  
90 bristles on the right hand and left hand sides of the implantation portion when viewed in cross-section and the axis of rotation of the grip portion is smaller than the distance between said points and the bristle axis. Preferably, the bristle axis is  
95 spaced by from 5 to 15 mm from the axis of rotation of the grip portion. The cross-section of the surface of the bristle implantation portion is preferably arcuate.

In the hairbrush of the present invention, the bristles and the handle may be molded integrally, but from the aspect of production efficiency, it is advisable to fit a bristle sheet, which is produced by implanting the bristles into a sheet or by integrally molding the bristles with the sheet, to the  
100 handle of the hairbrush.

One hairbrush embodying the invention will now be described with reference to the accompanying drawings in which:

*Figure 1* is a longitudinal section;

115 *Figure 2* is a cross-section through the implantation portions; and

*Figures 3 and 4* are sectional views showing alternative methods of implanting the bristles in the implantation portion.

120 In the drawings, reference numeral 1 represents the base of the implantation portion. The cross-sectional plane of the implantation surface of the base 1 is arcuate as shown in *Figure 2*, and the bristles 2 are implanted in the implantation surface extending radially from the bristle axis A in different directions so that the surface defined by the tips of the bristles is arcuate. Moreover, the longitudinal section C through the tips of the bristles is concavely curved as shown in *Figure 1*, and the radius of this curvature is preferably from 300 to 500  
130

mm, and more preferably from 350 to 450 mm. Since the section C is thus concave, the bristles can securely engage the hairs.

Furthermore, the longitudinal axis of rotation B of the grip portion 3 is parallel with the bristle axis A and is spaced apart therefrom towards the exposed portions of the bristles as shown in Figures 1 and 2, by a distance preferably within the range 5 to 15 mm.

The cross-sectional shape of the base 1 at the implantation portion is preferably hemispherical or semi-elliptical so that it is coaxial with the implantation axis A of the bristles and so that the bristles therefore extend from it radially.

The bristles 2 are preferably implanted so that the distance between the implantation points D of the bristles implanted at the right and left end portions and the axis of rotation B of the grip portion 3 in the longitudinal direction is smaller than the distance between the implantation points D and the bristle axis A, that is, so that the relationship  $AD > BD$  is satisfied as shown in Figure 2.

In the present device, the axis of rotation of the grip portion in the longitudinal direction is displayed from the bristle axis A towards the exposed portions of the bristles, and the range of implantation of the bristles is limited as described above. Accordingly, the radius of rotation of the hairbrush is reduced and the hairbrush is easier to rotate so that manipulation of the brush is facilitated and the hair-holding properties of the hairbrush are improved.

In the present device, the term "implantation" means not only direct implantation of the bristles, but also includes any method or means whereby the bristles are attached to the implantation portion. Therefore, the implantation method includes not only such a direct implantation of the bristle 2 into an implantation hole 6 formed in the implantation portion of the base by a pin 7 as shown in Figure 7, but also a method in which the bristles are fixed to a support 4 such as a flexible sheet or plastics material plate having the implantation holes, which is then wound around the implantation portion of the base. Filaments can be used in place of the pins 7. Moreover, the known method in which the implantation portion and the bristles are moulded integrally can of course be employed.

In order to protect the hair more effectively, it is preferred that one (5) of the ends of the bristles is not exposed to the base surface as shown in Figure 4.

In the present device, the shape of the base 1 is not limited to a particular configuration. Preferably, the cross-sectional shape of the base at the implantation portion is arcuate. If the radius of the implantation portion is from 5 to 25 mm, the hairbrush is easy to use. Similarly, the thickness of the bristle is preferably from 0.5 to 2 mm, and its exposed length, from 10 to 25 mm.

The base and the bristle may for example be made of a plastics material, but a metal or a wooden handle can also be used.

To obtain an easy-to-use hairbrush, the implantation density of the bristles is preferably 4 to 40

pcs/cm<sup>2</sup> and the length of the implantation portion is preferably within the range of 50 to 100 mm. To reduce the brushing force, one bristle is preferably implanted into each implantation hole, but the number of bristles may alternatively be up to 40 per implantation hole.

As shown in Figures 1 and 2, the hairbrush of the present invention changes the height of the bristles from the implantation portion to define an arc, so that the hairbrush exhibits excellent hair retaining properties and good separability of the hair when used for permanently waved hair or straight hair, and is convenient to use.

## 80 CLAIMS

1. A hairbrush having a base comprising an implantation portion from which bristles project and a grip portion formed as a continuation of the implantation portion, wherein the bristles converge radially on a longitudinal bristle axis in such a fashion that the surface defined by the tips of said bristles is arcuate in cross-section and concave in longitudinal section, and the axis of rotation of said grip portion in the longitudinal direction is parallel with the bristle axis and spaced therefrom by from 5 to 15 mm on the side of the exposed portions of said bristles.

2. A hairbrush as defined in Claim 1 wherein the cross-section of the implantation portion is constant.

3. A hairbrush as defined in Claim 1 or Claim 2 wherein the implantation portion is arcuate in cross-section with a radius of curvature of 10 to 30 mm.

4. A hairbrush as defined in any preceding claim wherein the bristles meet the implantation portion at points such that the distance between said points for the bristles on the right hand and left hand sides of the implantation portion when viewed in cross-section and the axis of rotation of the grip portion is smaller than the distance between said points and the bristle axis.